Global Precipitation Measurement (GPM) Mission Products and Services at the NASA Goddard Earth Sciences Data and Information Services Center (GES DISC)

NASA/Goddard EARTH SCIENCES DATA and INFORMATION SERVICES CENTER (GES DISC)

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Abstract

The NASA Goddard Earth Sciences (GES) Data and Information Services Center (DISC) hosts and distributes GPM data within the NASA Earth Observation System Data Information System (EOSDIS). The GES DISC is also home to the data archive for the GPM predecessor, the Tropical Rainfall Measuring Mission (TRMM). Over the past 17 years, the GES DISC has served the scientific as well as other communities with TRMM data and user-friendly services. During the GPM era, the GES DISC will continue to provide user-friendly data services and customer support to users around the world. GPM products currently and to-be available:

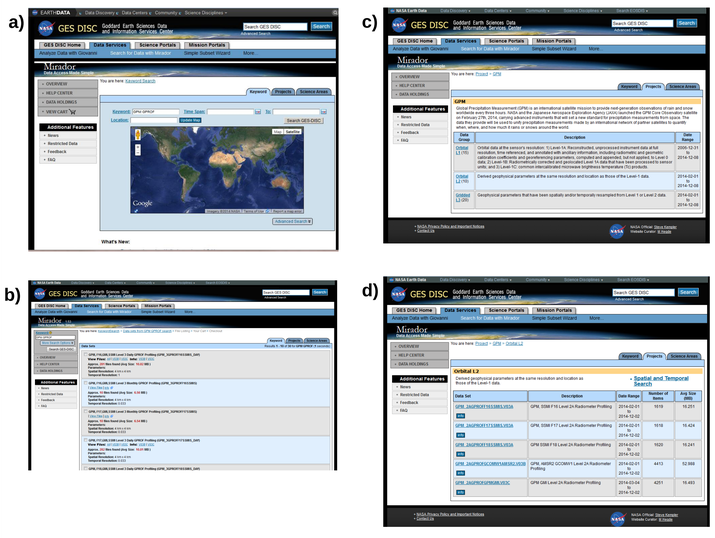
•Level-1 GPM Microwave Imager (GMI) and partner radiometer products, DPR products
•Level-2 Goddard Profiling Algorithm (GPROF) GMI and partner products, DPR products
•Level-3 daily and monthly products, DPR products
•Integrated Multi-satellitE Retrievals for GPM (IMERG) products (early, late, and final)

A dedicated Web portal (including user guides, etc.) has been developed for GPM data (http://disc.sci.gsfc.nasa.gov/gpm). Data services that are currently and to-be available include Google-like Mirador (http://mirador.gsfc.nasa.gov/) for data search and access; data access through various Web services (e.g., OPeNDAP, GDS, WMS, WCS); conversion into various formats (e.g., netCDF, HDF, KML (for Google Earth), ASCII); exploration, visualization, and statistical online analysis through Giovanni (http://giovanni.gsfc.nasa.gov); generation of value-added products; parameter and spatial subsetting; time aggregation; regridding; data version control and provenance; documentation; science support for proper data usage, FAQ, help desk; monitoring services (e.g. Current Conditions) for applications.

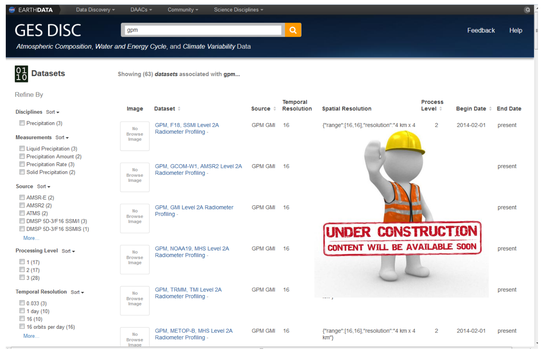
The United User Interface (UUI) is the next step in the evolution of the GES DISC web site. It attempts to provide seamless access to data, information and services through a single interface without sending the user to different applications or URLs (e.g., search, access, subset, Giovanni, documents).

Accessing GPM Data

Mirador made data access simple. One can search GPM products by typing in "GPM GPROF" in a) and the search results are shown in b). One can also use the drill-down menus to find the data (see c) and d) below).



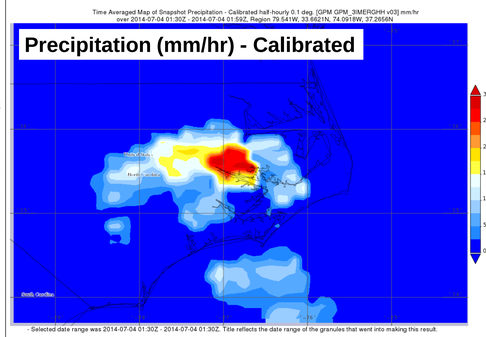
Right: The United User Interface (UUI) is the next step in the evolution of the GES DISC web site. It attempts to provide seamless access to data, information and services through a single interface without sending the user to different applications or URLs (e.g., search, access, subset, Giovanni, documents). The screen shot on the right is an example of the UUI under construction. The facets (similar to those at Amazon.com) help to refine search results and easily locate data products.

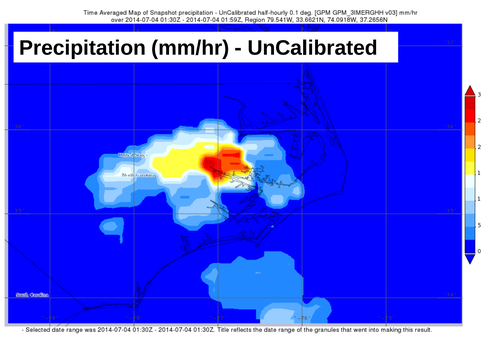


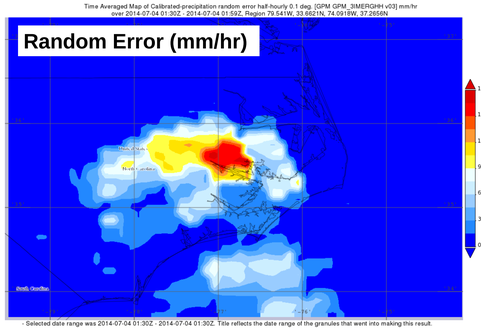
Parameters from the Level-2 GPROF-GMI product: (a) surface precipitation; (b) cloud water path; and (c) ice water path, showing Hurricane Arthur near the South Carolina and Georgia coasts on July 3, 2014.

IMERG Final is in Giovanni

Below: Sample half-hourly IMERG parameters from Giovanni showing heavy rainfall in North Carolina due to the passage of Hurricane Arthur on the 4th of July 2014.



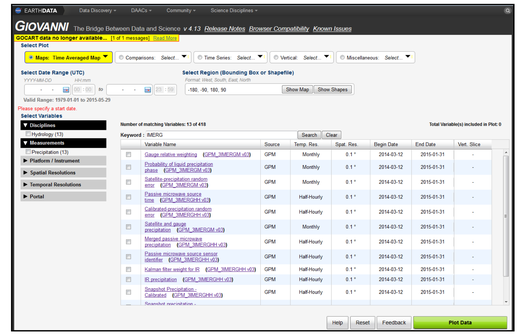




Giovanni allows online visualization and analysis without the need to download data and software. New functions, i.e., Quasi-Climatology Map, Seasonal Time Series, Shapefile, etc. have been added in the new Giovanni system, in addition to the existing functions.

Parameters in the 0.1 deg. 30-min IMERG products:
•precipitationCal
•randomError
•precipitationUncal
•HQprecipitation
•HQprecipSource
•HQobservationTime
•IRprecipitation
•IRkalmanFilterWeight
•probabilityLiquidPrecipitation

Parameters in the monthly product:
•Precipitation
•randomError
•gaugeRelativeWeighting
•probabilityLiquidPrecipitation



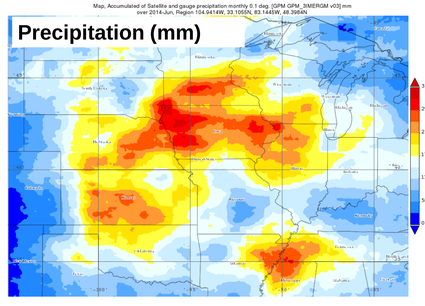
Screenshot showing that IMERG Final products in Giovanni for online visualization and analysis

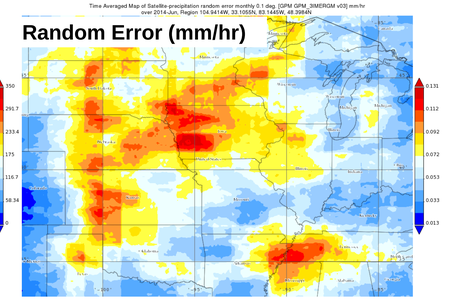
Further Readings:

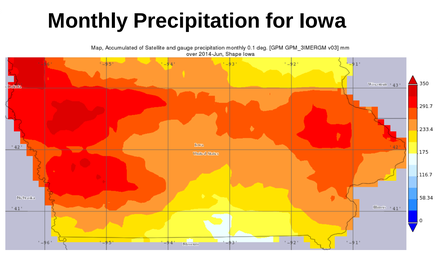
The IMERG Algorithm Theoretical Basis Document (ATBD):
http://pps.gsfc.nasa.gov/Documents/IMERG_ATBD_V4.pdf .

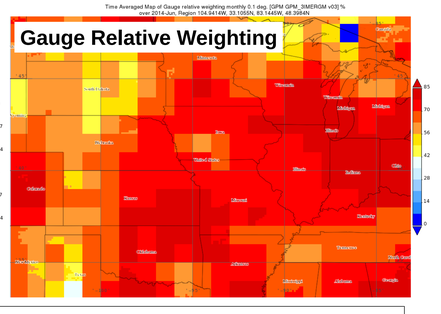
The technical document:
http://pmm.nasa.gov/sites/default/files/document_files/IMERG_doc.pdf

Below: Sample IMERG Final monthly parameters from Giovanni showing the flood of June 2014 in Midwest, USA

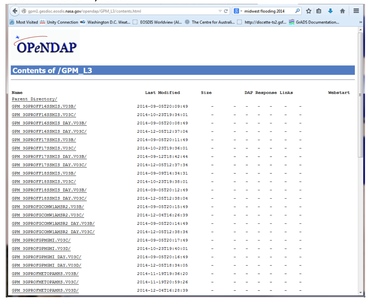




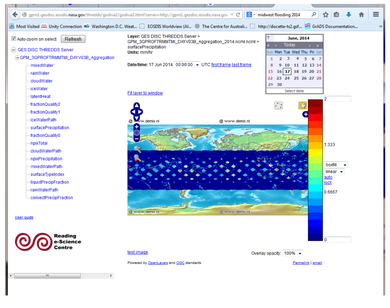




OPeNDAP provides program-level access to GPM data products. Features include parameter and spatial subsetting, format conversion, etc.



THREDDS provides more access methods to GPM data.



Related Links:

•IMERG Final DOI: Half-houly: 10.5067/GPM/IMERG/HH/3B; Monthly: 10.5067/GPM/IMERG/MONTH
•Mirador (searching, subsetting, format conversion, etc.). URL: http://mirador.gsfc.nasa.gov/
•Giovanni (Online visualization and analysis). URL: http://disc.sci.gsfc.nasa.gov/giovanni
•OPeNDAP: http://gpm1.gesdisc.eosdis.nasa.gov/opendap/
•THREDDS: http://gpm1.gesdisc.eosdis.nasa.gov/thredds/catalog.html
•Help Desk: gsfc-help-disc@lists.nasa.gov